DRAFT 4/97

4.6 Test of Vapor Extraction from an Unsaturated Reservoir

This test verifies that FEHM has correctly implemented steady-state gas flow in a 2-D radial system with an isotropic and an anisotropic permeability model. Figures 36 and 37 show that FEHM results are in good agreement with the analytical solutions (found in files *vapextractout_aniso.analyt* and *vapextractout_iso.analyt*) for the vapor-extraction simulations. The results of the numerical comparison to the analytical solutions are given in Table 48. The maximum absolute error in vapor pressure for the isotropic case was less than 0.002 MPa, and for the anisotropic case, it was less than 0.004 MPa. The maximum percent errors were less than 4%, and the RMS errors were less than 0.01 for both models. These results meet the acceptance criteria for this test suite developed in Chapter III.

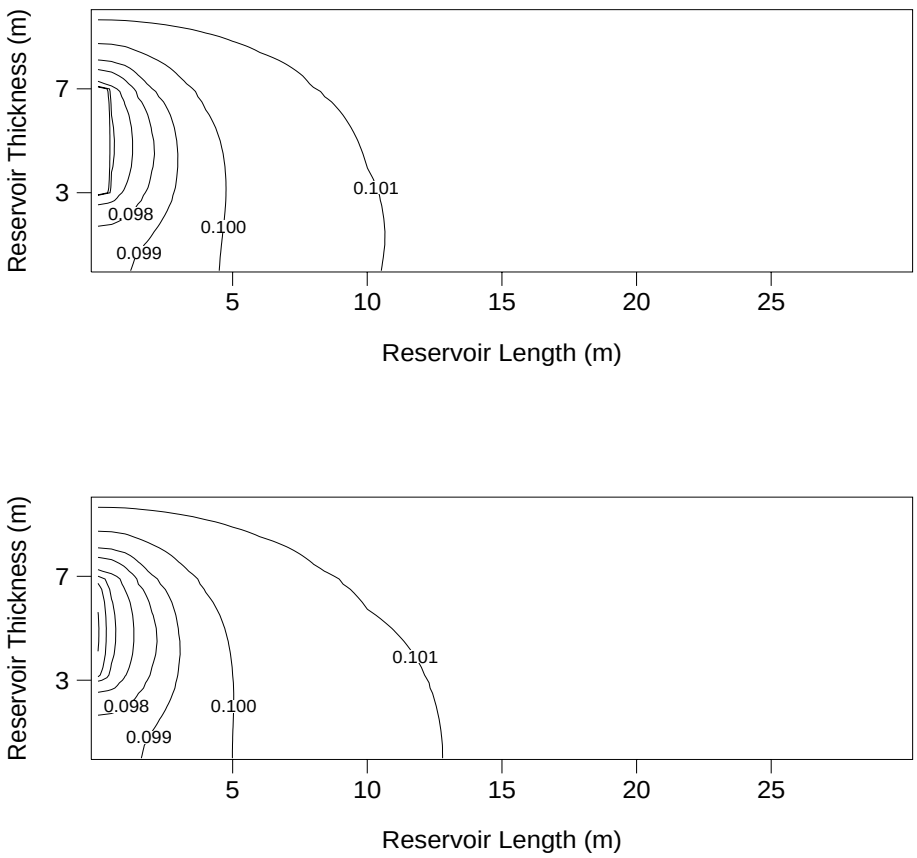

Figure 36. Comparison of FEHM steady-state vapor pressure (top) with Shan analytical solution (bottom) for an isotropic reservoir.

DRAFT 4/97

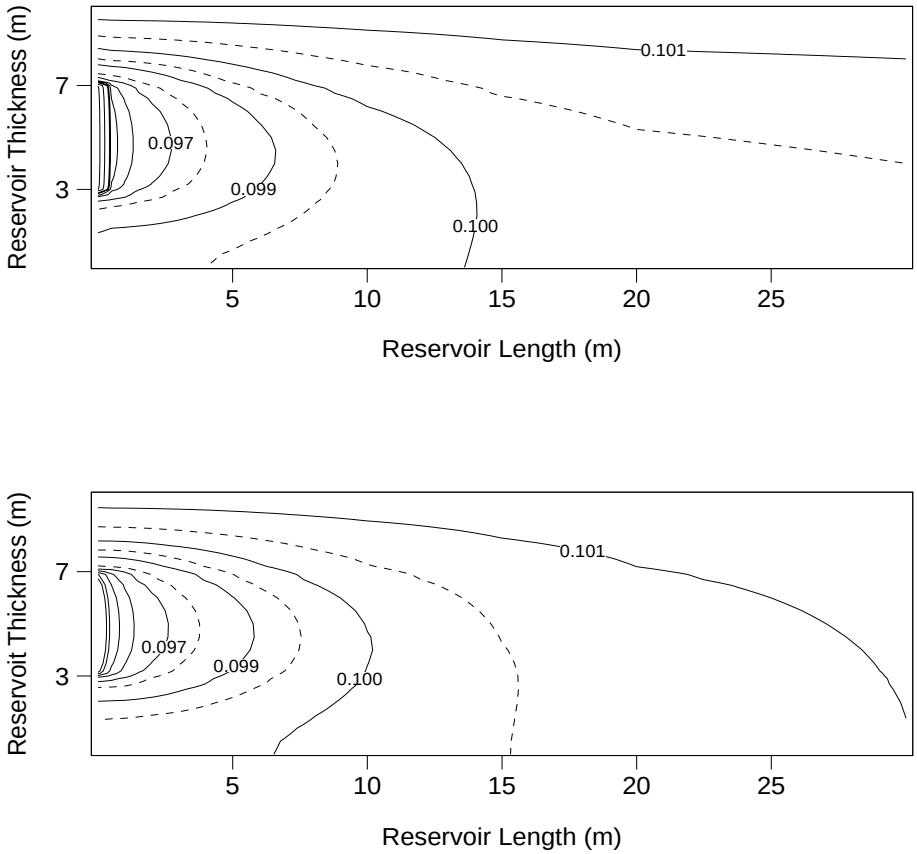

Figure 37. Comparison of FEHM steady-state vapor pressure (top) with Shan analytical solution (bottom) for an anisotropic reservoir.

Table 48. Results of the test of vapor extraction from an unsaturated reservoir

V&V test	Maximum error	Maximum % error	RMS error
Vapor pressures at each node			
Isotropic case	0.1983e-02	2.195	0.8838e-04
Anisotropic case	0.3066e-02	3.311	0.1436e-03